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NOTES ON NORTH AMERICAN EPHEMEROPTERA WITH DESCRIPTIONS OF NEW SPECIES, II.*

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BAETINAE

Leptophlebia adoptiva n. sp.

Male. Head and thorax shiny black with slight brown shading on the pleural sutures. Abdomen dorsally deep black-brown with the anterior portion of segments 4-7 faintly pale, hyaline, and with traces of a broken dark supraspiracular band; ventrally scarcely paler with similar hyaline areas and traces of small black spots in the postero-lateral corners of the middle segments. Legs deep brown. Setae dirty white ringed with dark brown. Wings hyaline with pale brown longitudinal veins; the crossveins pale, except in the costo-apical region. Length of body 7 mm.; of wings 7 mm.

Female. Rather uniformly deep brown, the head considerably tinged with ruddy. Legs deep amber-brown. The excavation of the anal plate is about half the length of the plate, rather broad and well-rounded at the bottom. Wings as in male.

Holotype.—♂, Kazubazua, Que., May 21, (G. H. Fisk); No. 2984 in the Canadian National Collection, Ottawa.

Allotype.—♀, same data.

Paratypes.—2♂, 10♀, same locality and data, collected by Messrs. Brown, Fisk and Adams.

The male genitalia (fig. 4) are closest to those of *mollis* Eaton, from which the species can at once be distinguished by the dark-colored male abdomen; in superficial appearance it resembles *ontario* McD.

Ephemerella flavilinea McD.

The species was described (1926, Can. Ent., lviii, 188) from a single male from Waterton Lakes, Alta. At Rocky Creek in the vicinity of Bozeman, Mont. I took a small series of *Ephemerella* females on August 10th, ovipositing at sundown; these specimens appear to belong to this species as they show the same ruddy-brown abdomen with distinct yellow lateral flange and the pale wing venation, the veins being only faintly tinged with brownish and the crossveins entirely pale. The head, anterior to the ocelli, is ochreous, tinged with ruddy brown between the black antennae; the vertex of the head, behind the ocelli is largely deep wine color with slight ochreous shading; the thorax is olive brown with tinges of ruddy laterally and posteriorly and the pleura are variably shaded with ruddy. In the legs the femora are more tinged with blackish than in my type male which is possibly rather teneral; the coxae, however, are pale yellowish and show a ruddy spot and the bases of the legs are tinged with ruddy.

*—Contribution from the Division of Systematic Entomology, Entomological Branch, Dept. of Agric., Ottawa.

In Yellowstone Park in the latter part of July I found numbers of subimagos emerging in the late afternoon from the Firehole river and from these I secured one adult male and seven or eight females. According to male genitalia these specimens also belong to *flavilinea* but they are considerably larger and much duller in color, the wine-red shading being obscured by olive-brown; however, they show the ruddy coxal spot in the females and the pale venation, this latter being the easiest character to use in separating from the very similar *coloradensis* which in certain specimens also shows ruddy tinges. This latter species matures apparently nearly a month later than *flavilinea* as I reared a long series from subimagos taken at Waterton Lakes in the last week of August and found plenty of full grown nymphs in all the park streams, as well as at Banff early in September. Mature nymphs from the Firehole river, Yellowstone Park which superficially greatly resemble *coloradensis* nymphs may be those of *flavilinea* but they have as yet not been sufficiently studied for me to comment on them. I offer figures of the male genitalia of both *flavilinea* (fig. 3) and *coloradensis* (fig. 2) and would call attention to the second joint of the forceps which shows distinctive specific characters.

***Ephemerella tibialis* McD.**

A long series of both sexes was secured by me at Banff, Alta. during the first week of September; they were swarming and mating at sundown around the bridge across the Spray river at its junction with the Bow; nymphs were also taken and will be described in another paper. This species extends into Montana as I secured two females and numerous nymphs in the vicinity of Bozeman about the middle of August. I give a much enlarged figure of the male genitalia (fig. 1).

***Ephemerella deficiens* Morg.**

Ephemerella deficiens Morgan, 1911, Ann. Ent. Soc. Am., vi, 111.
: *Ephemerella atrescens* McDunnough, 1925, Can. Ent., lvii, 43; id. 1925, Trans. Roy. Soc. Can., Sec. 5, 212.

In describing *atrescens* as distinct from *deficiens* Morg. I was misled by the statement that the sternum of *deficiens* showed "a broad transverse band of yellow behind the first pair of legs." At Covey Hill, Mr. G. S. Walley secured nymphal material which agreed excellently with the description of this stage of *deficiens* and these Covey Hill nymphs were pretty definitely associated with the adult to which I had applied the name *atrescens*. An examination of further material in alcohol brought to light the fact that the "broad transverse band of yellow" was merely the thinly chitinized and pale intersegmental membrane between the pro- and mesosterna, this being invisible in the dried specimens from which my description of *atrescens* had been drawn up. The synonymy will therefore stand as indicated above.

***Ephemerella heterocaudata* n. sp.**

Male. Eyes (dried) dark reddish brown. Thorax deep olive-brown, the pronotum shaded largely with black; mesonotum with the median and lateral sutures marked with black; anterior to the wing base is a yellowish patch, containing a black line which descends down to the coxa of the foreleg; mesosternum largely black-brown with olive-brown shading around the bases of the legs. Abdomen dorsally olive-brown with broad black bands on the anterior half of the first four segments, these bands on the posterior segments becoming reduced

to large semicircular dorsal patches; a series of lateral black patches, distinct on the rear segments but becoming fused with the dorsal bands on the anterior segments so that these segments appear largely black. Ventrally pale olive with a irregular, black, medio-ventral band and similar lateral ones, cut by the pale intersegmental incisions. Setae smoky, the median one being over twice as long as the lateral ones. Forceps smoky, with short third joint; penes fused to form a narrow upcurved rod. Legs deep olive, the fore femur and tibia tinged with blackish; fore tarsus and tibia about equal in length and both distinctly longer than the femur. Wings hyaline with slightly smoky veins and pale crossveins. Length of body 6.5 mm.; of wings 7 mm.

Female. Similar in maculation to the male but paler in color of thorax; head light ochreous, with three blackish dots behind the ocelli and a median black patch with two lateral dots on the vertex.

Holotype.—♂, Upper Geyser Basin, Yellowstone Park, Wyo., (bred from subimago), July 29, (J. McDunnough); No. 2993 in the Canadian National Collection, Ottawa.

Allotype.—♀, Upper Gallatin Canyon, Mont., July 20, (J. McDunnough).

The full-grown nymph, which I took in the Firehole river, Yellowstone Park, is dark brownish with the same black abdominal markings as in the adult and with a double row of strong black dorsal tubercles on segments 2-9, longest and most widely separated from each other on the gill-bearing segments and minutely spined and white-tipped. Gills on segments 3-7, blackish and slightly overlapping. Setae blackish-brown, the median one nearly three times the length of the outer ones; the posterior margin of each segment with a whorl of weak spines.

A more detailed description of this nymph will be published in another paper dealing with the early stages of a number of species belonging to this genus.

***Centroptilum bifurcatum* McD.**

This species was described (1924, Can. Ent., lvi, 96) from a single male from Waterton Lakes, Alta. and attention was directed in the name to the forking of vein 2 of the hindwings near its apex. Further specimens of the species were collected by me during the latter half of August, 1928, both at Waterton Lakes and at Lethbridge, Alta. I find from an examination of these that the forking of the above-mentioned vein is not a constant feature and should not be used as a specific character, none of my additional Waterton specimens and only two of my Lethbridge ones possessing it.

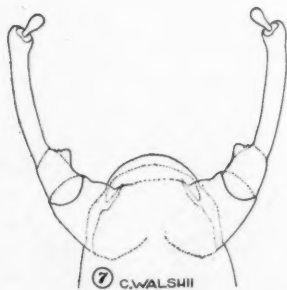
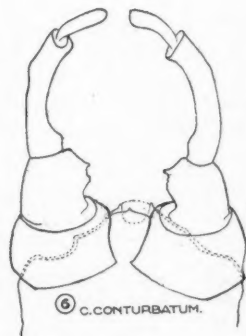
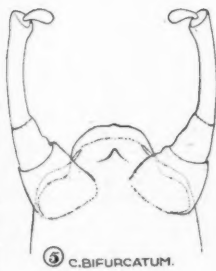
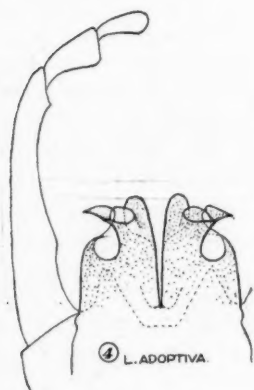
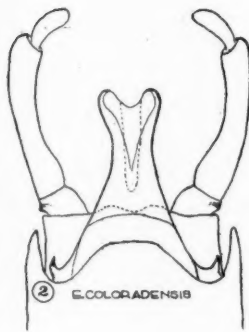
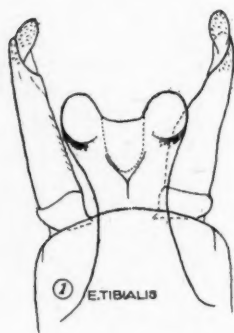
I give a figure of the male genitalia (fig. 5), showing a small pointed tubercle between the basal joints of the forceps. This allies the species with the Eastern *semirufum* McD. and with the European *luteolum* Mull. This latter species has been listed from North America on the strength of Eaton's record (Mon. Eph. 175/6) from the Hudson Bay region; I think it probable, however, that this record was based on a specimen of *semirufum* which is very similar in maculation but possesses considerably broader hindwings; the name *luteolum* should therefore be dropped from our lists.

***Centroptilum conturbatum* n. sp.**

Male. Eyes (dried) dark black-brown. Head and thorax shiny black, the pleural sutures brownish. Abdomen dorsally with segments 2-6 and part of

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PLATE 3.



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7 white, hyaline, with occasional faint dusky shading on posterior portion of middle segments; segments 8-10 and at times part of 7, chocolate brown; ventrally white with segments 1-6 hyaline and 7-10 opaque. Legs and setae white, immaculate. Wings hyaline with colorless veins and crossveins. Male forceps (fig. 6) distinguished by the tubercular nature of the inner margin of the first joint and the long third joint. Length of body 5 mm.; of wings 5 mm.

Female. Head ruddy brown, tinged with yellowish at vertex next the eyes. Thorax brown with slight ruddy tinge. Abdomen ruddy brown dorsally, white ventrally. Legs and setae pale, the former at times slightly tinged with brownish.

Holotype.—♂, Cameron Lake, Waterton Park, Alta., August 20, (J. McDunnough); No. 2985 in the Canadian National Collection, Ottawa.

Allotype.—♀, same data.

Paratype.—6 ♂, 5 ♀, same data.

This small species, readily recognizable by its dark thorax and white anterior portion of abdomen, was captured swarming over a small drainage creek in the late afternoon on the borders of Cameron Lake at an altitude of about 6000 ft.; the type of male genitalia would appear to ally it with *album* McD.

***Centropitulum walshi* n. sp.**

Male. Eyes, (alive), pale yellow; (dried), bright reddish. Pro and mesonotum light ochreous brown, shading on the posterior one-third of mesonotum into creamy; metanotum and entire sternum creamy. Abdomen with segments 2-6 hyaline white, with broken black spiracular line; segments 7-10 opaque, creamy, shaded dorsally with light purplish brown (the purplish color may be due to discoloration). Legs and setae whitish. Wings hyaline with pale venation.

Female. Light ochreous, the abdomen dorsally tinged faintly with a ruddy shade and considerably blotched (as is frequently the case in this genus) with black. Length of body 6 mm.; of wings 6 mm.

Holotype.—♂, Clinton, Ia., July 23, (G. S. Walley); No. 2986 in the Canadian National Collection, Ottawa.

Allotype.—♀, Homer Park, Ill., June 30, (T. H. Frison).

Paratypes.—1 ♂, Oakwood, Ill., June 8, (Frison and Auden); 1 ♂, Homer Park, Ill., June 30, (T. H. Frison); 1 ♀, Oakwood, Ill., June 9, (Frison and Auden).

The species is evidently allied to *album* McD. but the male forceps (fig. 7), show a much stronger tubercle on the inner side of the basal joint apically. The size of the species is considerably greater than that of *album* and the pale metanotum and entire sternum, as compared with the wood-brown color of these parts in *album* is a further character which will at once distinguish it in the male sex.

A female specimen of this species, originally sent by Walsh to Hagen, is in the Museum of Comparative Zoology at Cambridge, Mass., labelled *mendax* Walsh. I do not think this specimen can be regarded as representing a true type as Walsh originally placed *mendax* in a section containing species with only two wings and drew up his description largely from a single male, as follows: "♂, Pale ferruginous. Seta of antennae fuscous, pale at tip. Sternum and venter pale greenish hyaline, the latter opaque at tip. Legs pale, tips of tarsi cloudy.

Wings hyaline, veins moderate, cross-veins fine, all hyaline; isolated veinlets all single."

Judging by this description one would expect *mendax* to be a *Cloeon* with the dorsum of the abdomen entirely pale ferruginous in the male sex and, as I have several specimens of a *Cloeon* from southern Ontario before me which fit in, at least in this respect, with Walsh's description, I am holding the name *mendax* to these specimens, until topotypical material can be secured.

***Ameletus cooki* n. sp.**

Male. Head, prothorax, postero-lateral portions of mesothorax and metathorax blackish; mesothorax dorsally brown shaded with orange-brown anterior to wing base and on and before the scutellum; pleura and sternum largely blackish with orange shading at base of legs, especially of midlegs. Abdomen dorsally orange-brown, with slight duller brown suffusion along the lateral margin which tends to form obscure semitriangular patches in the postero-lateral corners and sometimes extends narrowly along the posterior margin of segment; tracheae forming a black network on the anterior segments. Beneath, segments 2-6 dull hyaline whitish with traces of orange in the median line; segments 7 and 8 opaque, bright ochreous; segment 9 largely black-brown with ochreous tinges; forceps-base ochreous; setae dirty whitish with dark intersegmental rings. Prolegs blackish brown; mid and hind legs lighter brown with their basal joints tinged with orange-brown. Wings hyaline, the longitudinal veins light amber, the crossveins pale and indistinct except in the costo-apical area where they are tinged with smoky. Length of body 7 mm.; of forewings 8 mm.

Holotype.—♂, Brackett Creek, near Bozeman, Mont., Aug. 7, (J. McDunnough); No. 3037 in the Canadian National Collection, Ottawa.

Allied to *dissitus* Eaton but smaller and more slender. In the male genitalia (fig. 10) the apical portion of the penes is neither so thick nor so strongly incurved and the stimuli, (situated between the penes and the basal plate of the forceps) are not nearly so long. I take pleasure in naming the species after Dr. W. C. Cook through whose instrumentality I was enabled to visit so many of the collecting grounds around Bozeman.

***Ameletus similior* McD.**

This species was described from females in alcohol from Jasper Park, Alta. In late August, 1928, I found several subimagos of an *Ameletus* species sitting in the early morning on the rocks at the edge of Cameron Creek, Waterton Lakes Park, Alta, and from these I obtained in due course one perfect female adult and one male that was only partially able to shed its skin. These specimens proved to be *similior* McD., showing the characteristic brown medio-ventral blotches. In the male, heretofore unknown, the thorax is shiny black-brown and the abdomen as far as can be judged, deep brown, shaded with lighter brown, much as in *velox* Dodds; I figure the male genitalia (fig. 12) which are also quite similar to those of *velox* but with the tubercles between the forceps-bases less developed and with the penes wider apart and less incurved apically.

***Siphonurus barbaroides* n. sp.**

Male. Very similar to the eastern *S. barbarus* McD. and still more so to the western *S. columbianus* McD. but differing in the finer details of the

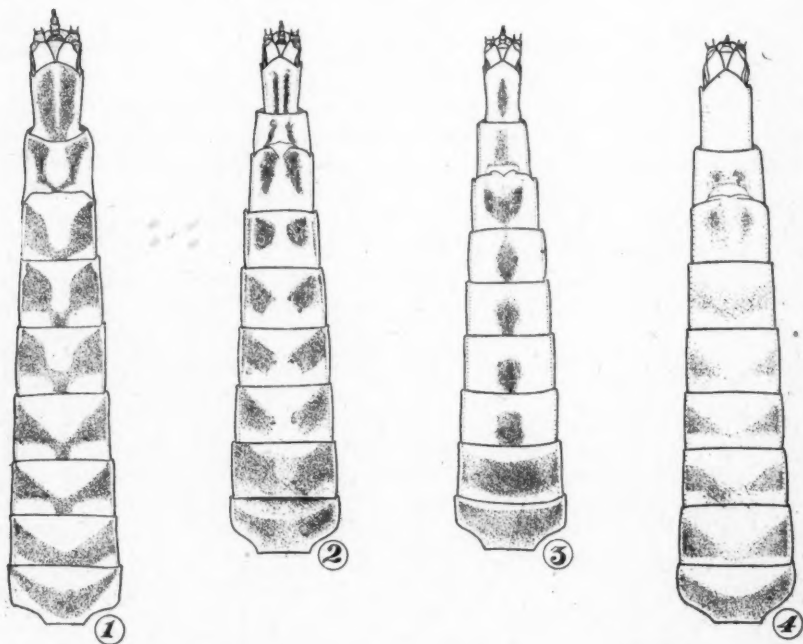
genital structure; as in *columbianus* (vide Can. Ent., 1925, Pl. V, fig. 14) the penes are drawn out laterally into short, blunt points (fig. 9) which at once distinguishes them from those of *barbarus* (fig. 8); the spinulation is finer and more extended than in *columbianus*.

The abdominal pattern is essentially the same as in *barbarus*; in my type series the thorax and abdomen dorsally are deeper in color than are the types of *barbarus*, being pitch black instead of pitch brown, but this may merely be due to the freshness of the specimens. The size is about that of *barbarus* and considerably less than that of *columbianus* and the wings show none of the brownish tinges in the pterostigmatal region found in this latter species. Length of body 10-11 mm.; of forewings 10 mm.

Holotype.—♂, Knowlton, Que., June 14, (W. J. Brown); No. 2997 in the Canadian National Collection, Ottawa.

Allotype.—♀, same data, captured in copulation with the holotype ♂.

Paratypes.—14 ♂, 8 ♀, same locality, June 13-14, (Brown, Fisk, Adams).

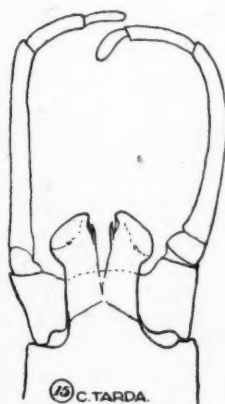
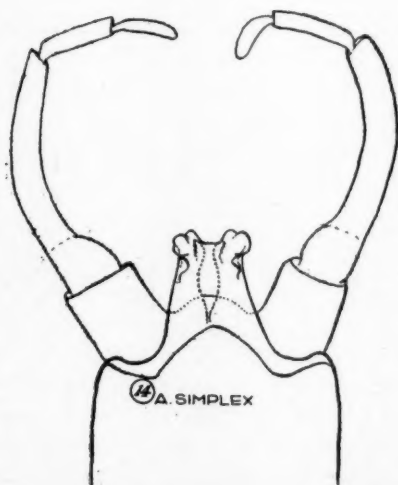
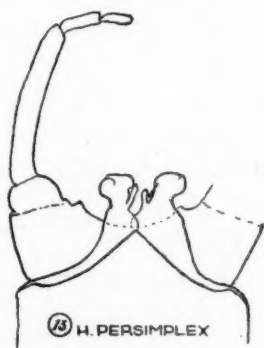
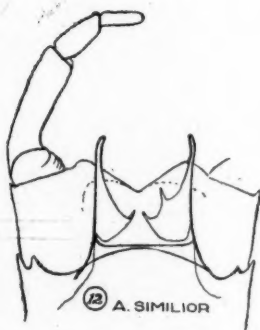
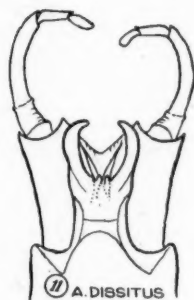
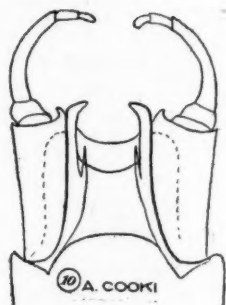


Ventral abdominal maculation of (1). *Siphonurus quebecensis* Prov. (2). *S. barbaroides* McD. (3). *S. rapidus* McD. (4). *S. berenice* McD.

In the Knowlton region three other species of *Siphonurus* occur, viz.: *quebecensis* Prov. (*triangularis* Clem.), *rapidus* McD. and *berenice* McD. (*novangliae* McD.); from fresh alcohol material of the above four species Mr. G. S. Walley

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PLATE 4.



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has prepared the present drawing, depicting the ventral abdominal maculation and the female genital plate which shows good characters for separation and is very useful in determining specimens which have been in alcohol for a considerable length of time and in which in consequence the color pattern has been more or less lost. The holotype female of *triangularis* Clem. is such a specimen, for example, and the synonymy of this species with *quebecensis* Prov. might have remained doubtful if it had not been possible to use this character.

HEPTAGENIINAE

***Epeorus albertae* McD.**

Iron albertae McDunnough, 1924, Can. Ent., lvi, 129.

In describing this species as an *Iron* I find I overlooked the similarity of the claws on the male fore tarsus, both being blunt, a feature which is characteristic of the genus *Epeorus*.

In 1928 I took specimens of *albertae* in both the Yellowstone Park, Wyo. and in the vicinity of Bozeman, Mont. and while not actually breeding them through was pretty definitely able to associate the adults with a typical *Epeorus* nymph found at the same time in the adjacent streams; it is evidently this same nymph which has been figured by Needham in Bulletin 201, Utah Agricultural Experiment Station, fig. 18, 1927.

Comparisons between the western *albertae* nymphs and the eastern *humeralis* ones showed that a great similarity exists between the two in all structural characters; in the adult males of *humeralis*, however, the fore tarsal claws are dissimilar, one being blunt and the other sharp; unless, therefore one is willing to split still further it would seem that this difference in the male fore tarsal claws cannot be used as a generic character. As far as my present knowledge of the nymphs and adults goes I believe that *albertae* McD., *humeralis* Morg., *suffusus* McD. and *punctatus* McD. are all best placed in *Epeorus*.

As to whether *Epeorus* and *Iron* should remain separate and if so, on what characters, is a matter which I hope in a later paper to discuss at more length. I must, however, emphatically disagree with Lestage's classification (1917, Ann. Biol. Lac., viii, 238) which actually places *Epeorus* and *Iron* in different subfamilies on the strength of characters drawn from the first pair of nymphal gills; all other structural details of the nymph (setae, mouth-parts, etc.) and of the adult (length of first tarsal joint in male, genitalia, etc.) show such a marked relationship between these two genera in contradistinction to the other genera of the Heptageniinae, that it would certainly seem as if too great emphasis had been laid by Lestage on the variations in gill-shape; such fragile body-appendages as Ephemerid gills must of necessity react very quickly to environmental conditions and while doubtless offering good specific and even possibly generic characters cannot with safety be used as a sole means of separating subfamilies, most especially so in cases where other more stable structural details are in direct contradiction to such a classification.

***Iron deceptiva* McD.**

When describing this species as *Cinygma deceptiva* (1924, Can. Ent., lvi, 132) I called attention to the fact that Dodds (1923, Trans. Am. Ent. Soc., xlix, 107, Pl. ix, figs. 19-22) had confused two species under the name *longimanus*

Eaton. It now turns out that the nymph (figs. 19, 20) which he attributed to *longimanus* is really that of *deceptiva*, the true *longimanus* nymph being figured by the same author as *Iron* nymph No. 1 (figs. 23, 24).

In the latter part of August, 1928, I took a number of full grown nymphs of *deceptiva* in Cameron Creek, Waterton Park, Alta. and at the same time captured the subimagos as they were emerging from the stream, securing a good series of adult specimens in due course. Odd nymphs and subimagos of *longimanus* were also taken but this species at the time was practically over, its main emergence occurring almost a month earlier than that of *deceptiva*.

As pointed out by Dodds, *deceptiva* nymph may be distinguished from that of *longimanus* by the less developed first pair of gills and the lack of a round dark spot, situated about the middle of each femur, which is found both in the nymph and adult of *longimanus*. Needham has recently (1927, Bull. 201, Utah Agricultural Experiment Station, p. 15) given a correct figure of *longimanus* nymph but has failed to correct Dodds' error, a matter of some importance since *longimanus* is the genotype of *Iron*.

Cinygma tarda n. sp.

Male. Eyes almost contiguous, dull greenish (alive). Head light wood-brown, bases of antennae ochreous, slight purplish or ruddy tinges at times next the eyes. Thorax light brown, shaded with yellowish ochre on the mesothorax, anterior to scutellum, and on the anterior portion of metathorax; pleura shaded with ochreous. Abdomen dorsally light brown, the anterior one-half to two-thirds of segments 3-7 pale hyaline, the brown color concentrated more particularly in the postero-lateral corners; segments 8-10 rather brighter brown than the preceding segments with ochreous tinges laterally; ventrally largely pale hyaline with brown medioventral oval patches and segments 8 and 9 opaque, deep ochreous. Setae dirty white. Legs pale brown. Wings hyaline, the crossveins in the basal half pale, indistinct, darker and better defined in the apical area, especially the costal ones. Length of body 7 mm.; of forewing 7.5 mm.

Female. Much as in male but with darker abdomen; head dull clay brown variegated in the ocellar region with brighter brown.

Holotype.—♂, Banff, Alta., August 29, (J. McDunnough); No. 2988 in the Canadian National Collection, Ottawa.

Allotype.—♀, same data.

Paratypes.—40 ♂, 1 ♀, same data.

The species belongs in the *mimus-ramaleyi* group but differs in male genitalia structure (fig. 15). It was very common, swarming at dusk along the banks of the Bow river near the railway station. I also took long series of the same species in the Upper Gallatin Canyon, Montana, earlier in August; it apparently frequents all the smaller streams of this region along with *ramaleyi*; the Montana specimens are rather brighter in coloration than the Alberta ones.

Anepheorus simplex Walsh.

In working over a collection of Ephemeroptera made by Mr. G. S. Walley in the vicinity of Davenport, Ia., a locality directly across the Mississippi river from Rock Island, Ill., where Walsh's material was collected, I came across a single male Heptageniid which I believe to be the true *simplex* Walsh. In describing the species (as *Heptagenia simplex*) Walsh calls particular attention to the short-

ness of the fore tarsus in the male "which never exceeds three-fourths the length of the tibia." My specimen, besides agreeing excellently with the rest of the description, shows just this peculiarity, the fore tarsus being scarcely more than one-half the length of the tibia, the individual joints being short and more or less subequal. The species very evidently falls into the genus *Anepeorus*, a reference which is borne out by the male genitalia, herewith figured (fig. 14); I would call particular attention to the strong excavation at the base of the forceps, a feature apparently only found in this genus.

I have stressed the length of the fore tarsus in my above notes as it seems probable that Walsh confused two very similarly colored species under the name *simplex*. The specimens sent by him to Hagen under this name and now in the Museum of Comparative Zoology at Cambridge, Mass. do not agree with his original diagnosis in respect to the male fore tarsus which in the Cambridge specimen is actually longer than the tibia and has joint 1 about one-half the length of joint 2, which is considerably longer than joint 3. I believe that these specimens cannot be considered to represent the true *simplex*.

Mr. Walley fortunately secured a small series of this second species which is quite distinct on structural and genitalic characters, although (as I have already noted) very similarly colored. As it appears to be unnamed I describe it as follows:

***Heptagenia persimplex* n. sp.**

Male. Eyes wide apart. Vertex of head between the eyes bright yellow, shading into pale creamy below the antennae. Thorax creamy with yellowish tinge at bases of fore legs. Abdomen pale creamy, hyaline, the last three segments opaque. Setae whitish. Legs pale yellowish, shading into dirty whitish on the tibiae and tarsi; fore tibia tipped with smoky; whole fore-tarsus distinctly longer than the tibia; normally joint 1 is about one-third the length of joint 2, which is subequal to 3 and twice as long as 4, joint 5 being about same length as 1; (there appears, however, to be considerable variation in the relative lengths of the tarsal joints and the two legs of the type male are not even similar). Wings hyaline with dark crossveins, those of the costo-apical section being somewhat thicker than the others but not nearly so noticeable in this respect as are those of *simplex*; the costal crossveins are also more numerous between the base of wing and the bulla (5-6) than in *simplex* (3-4) and in consequence the distance between the basal crossvein and the next following is not nearly so long. Length of body 7 mm.; of forewings 7.5 mm.

Female. Very similar to the male in coloration with abdomen slightly more yellowish, due to the underlying egg masses.

Holotype.—♂, Pleasant Valley (near Davenport), Ia., June 22, (G. S. Walley); No. 2987 in the Canadian National Collection, Ottawa.

Allotype.—♀, Clinton, Ia., June 23, (G. S. Walley).

Paratypes.—1 ♂, ♀, Ames, Ia., July 22, (G. S. Walley); 1 ♀, Clinton, Ia., June 23 (G. S. Walley).

The species is placed in *Heptagenia* on account of the type of male genitalia (fig. 13); on length of fore tarsal joints alone it could just as well be included in *Ecdyonurus* as I use it at present.

Heptagenia cruentata Walsh.

Heptagenia cruentata Walsh, 1863, Proc. Ent. Soc. Phil., ii, 205.

Heptagenia reversalis McDunnough, 1924, Can. Ent., lvi, 118.

Material brought back by Mr. G. S. Walley from Davenport, Ia. proves conclusively that *reversalis* McD. is a synonym of *cruentata*. The Manitoba specimens on which I based the name *reversalis* show little of the ruddy coloration of the tibiae mentioned by Walsh as characteristic of *cruentata*, but in all other respects, including male genitalia, are similar; the amount of ruddy suffusion on the tibiae and on the head of the female is probably variable in individuals and depends partially on the age of the specimens.

Rhithrogena robusta Dodds.

Rhithrogena robusta Dodds, 1923, Trans. Am. Ent. Soc., xlix, 103.

I secured a male specimen of this species at Lake Minnewanka, Banff, Alta., Sept. 1, 1928. It is a new record for our Canadian fauna.

It might be noted that Dodds' figure of the genitalia (*op. cit.* fig. 12) represents the penes in a rather distorted and unnatural condition, the apices being normally wide apart and not curved in at the tip; the peculiar truncate nature of the extreme apex and the arrangement of spines leaves, however, little doubt as to the correct identity of the specimen before me.

NEW CANADIAN ANTHOMYIDS BELONGING TO THE GENUS
HYLEMYIA ROB.-DESV. (MUSCIDAE, DIPTERA).

BY H. C. HUCKETT,

Riverhead, N.Y.

(Continued from page 168)

Hylemyia brevipalpis sp. nov.

Male grayish; head densely grayish pollinose with reddish black reflections; frontal vitta opaque black, viewed from below with grayish pruinescence; antennae with second segment obscurely reddish apicad, third segment blackish; palpi blackish; proboscis lightly pollinose. Thorax grayish pollinose, with black reflections; viewed from the side, the mesonotum with three brownish vittae. Abdomen more densely grayish pollinose, with dark reflections, each tergum has a broad subtriangular fuscous mark. Legs blackish, tibiae obscurely reddish, pulvilli tinged. Wings clear; veins yellowish brown; calyptrae tinged; halteres yellow.

Head fully as long as high, with eyes separated by a distance about equal to that between first pair of dorsocentral bristles: frontal vitta uniformly broad throughout, equal in breadth to length of second antennal segment; cruciate setae present: parafrontal bristles extend caudad to a level with anterior ocellus: para-facials about equal in breadth to three-quarters length of third antennal segment; cheeks narrowly constricted: buccal and vibrissal areas prominent: oral margin reaches beneath the apex of antennae; distance from vibrissal margin to eye nearly equal to length of antennae; marginal bristles of cheek in an irregular series, unequally developed, those on buccal margin much shorter; third antennal segment 1.5 times as long as second; arista long pubescent, longest hairs about equal in length to breadth of third antennal segment; palpi short, slightly longer than third antennal segment; proboscis elongate, distal half nearly as long as fore tibia. Thorax with acrosticals in an irregular, paired series, presutural bristles moder-

ately developed, setulose: posthumeral bristle not duplicated: prealar bristle longer than posterior notopleural bristle; sternopleural bristles, 1:2. Abdomen short, stoutly developed, margins subparallel: hypopygium prominent: processes of fifth sternum with a fringe of fine, longish setulae around the inner margin, proximal half of inner border with a series of four strong spines, outer border with an irregular series of strong bristles from base to apex.

Fore tibia with a strong, median anterodorsal bristle and 1 posteroventral bristle, apical posteroventral bristle sharply pointed: mid femur with a series of weak anteroventral bristles except for two bristles on median third which are well developed, posteroventral surface with 2 widely spaced bristles on proximal half; mid tibia with 2 anterodorsal, 2 posterodorsal, and 2 posteroventral bristles; hind femur with a complete series of anteroventral bristles, and a few bristles on proximal half of posteroventral surface; hind tibia with 2 anteroventral, 4 anterodorsal, 4 posterodorsal bristles, and 1 or 2 setulae on median third of posterior surface. Wings with costal thorn moderately developed.

Female similar to male, paler in colour; thorax and abdomen obscurely marked, the latter with traces of dorsocentral marking and of incisures; wings tinged with yellow, especially basad; arista swollen at base, with hairs plumose.

Fore tibia with 2 anterodorsal and 1 median posteroventral bristle; mid femur with 1 or 2 bristles on proximal half of anteroventral surface, and a strong bristle on proximal half of posteroventral surface; mid tibia with 1 anteroventral, 2 anterodorsal, 2 posterodorsal, and 2 posteroventral bristles; hind femur with an entire series of anteroventral bristles, and 1 or 2 bristles on proximal half of posteroventral surface; hind tibia with 2 anteroventral, 4 anterodorsal, 3 posterodorsal, 3 posterodorsal bristles. Wings with veins R_{4+5} and M_{1+2} subparallel; *m-cu* cross vein slightly sinuate. Length, 6-6.25 mm.

Records:—1 ♀ Waterton, Alta., July 11, 1923; 1 ♂ July 12, 1923; 1 ♀ July 17, 1923 (H. L. Seamans).

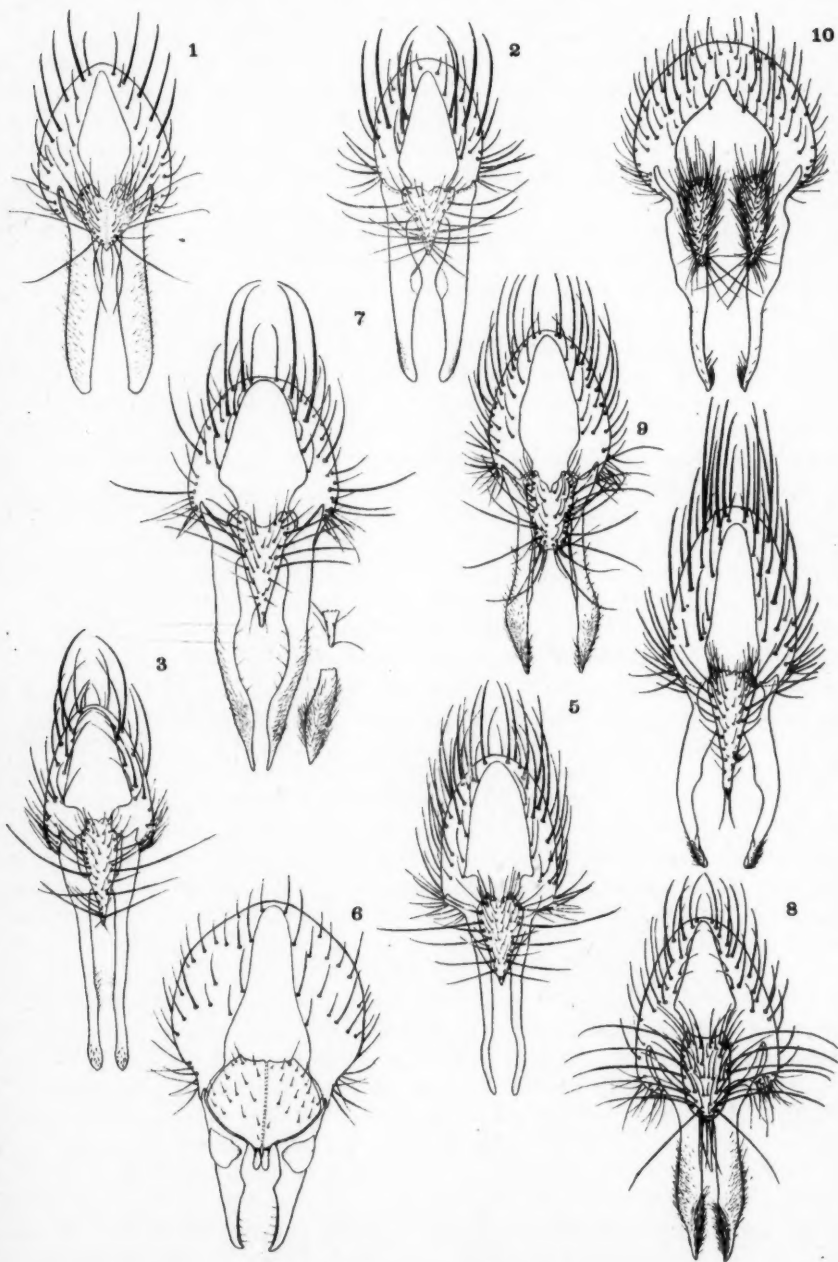
Type and *allotype* No. 2935 in Canadian National Collection.

The species belongs to the group containing *spinidens* Mall., *marginata* Stein, and *spiniventris* Stein. The male may be readily recognized by the broad frons, short palpi, and prominently produced buccal area. In the female the palpi are likewise short, and the buccal area is prominently produced cephalad, the cheeks are very noticeably constricted beneath the ventral margin of eye.

***Hylemyia pedicellaris* sp. nov.**

Male blackish; head with frontal vitta reddish to black; parafacials and cheeks silvery pruinulent with reddish to blackish reflections; antennae and palpi black; proboscis polished. Thorax infuscated, subshining, with a trace of brownish pollen, viewed from behind with indications of three vittae. Abdomen subshining, lightly grayish pollinose, with dark reflections, dorsocentral vitta fuscous, and visible when viewed from behind. Legs blackish. Wings faintly tinged, densely infuscated basad; veins chocolate brown. Calyptrae tinged, whitish; halteres yellowish.

Head with eyes separated at narrowest by a distance equal to that between posterior ocelli; parafrontals separated by a narrow frontal vitta which becomes gradually broader cephalad: parafrontal, ocellar, and postorbital bristles fine and



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long, the former with five or six pairs; cruciate setulae present; parafacials and cheeks, in profile, scarcely equal in breadth to that of third antennal segment, the latter considerably narrowed caudad by the encroachment of marginal setae, marginal bristles and vibrissae longish and fine; buccal area with a short upward curved series of bristles; arista minutely pubescent, little thickened basad; palpi slender, with fine, longish bristles.

Thorax with acrosticals paired, in two series, with three bristlelike, widely separated, presutural pairs: posthumeral bristles weakly duplicated: prealar bristle nearly as long as posterior notopleural bristle: sternopleural bristles, 1:3: scutellum with a well developed basal pair of bristles. Abdomen crushed, the marginal bristles, like those of the head and thorax, noticeably slender on the distal portion and inclined to curl; prebasal sclerites of hypopygium with numerous bristles, erect and upwardly curved; processes of fifth sternum platelike or bladelike, rounded apicad, the ventral (inner) border and apical region polished, bare, the ventral (inner) margin with a short series of setulae at base, and a fringe of fine hairs along the remainder of the surface, the dorsal (outer) border lightly pollinose, with a few scattered, short bristles from base to apex.

Fore tibia with 1 median posteroventral bristle, and a short, pointed apical posteroventral bristle: mid femur with a complete series of posteroventral bristles: mid tibia with 2 posteroventral bristles; hind femur with a complete series of 7 or 8 anteroventral bristles, and 1 or 2 bristles on proximal half of posteroventral surface; hind tibia with 2 anteroventral, 3 anterodorsal, and 1 proximal postero-dorsal bristle, posteroventral surface with or without 1 or 2 semierect setulae, preapical dorsal bristle fine and slender, with an apical series of 3 or 4 long, slender setulae on posterodorsal surface. Fore tarsi about equal to length of fore tibia; mid and hind tarsi shorter than their respective tibiae, hind metatarsus with a series of longish setulae along the posterior surface. Wings with costal thorn small; veins R_{4+5} and M_{1+2} subparallel; $m-cu$ cross vein slightly sinuate. Length, 4.75 mm.

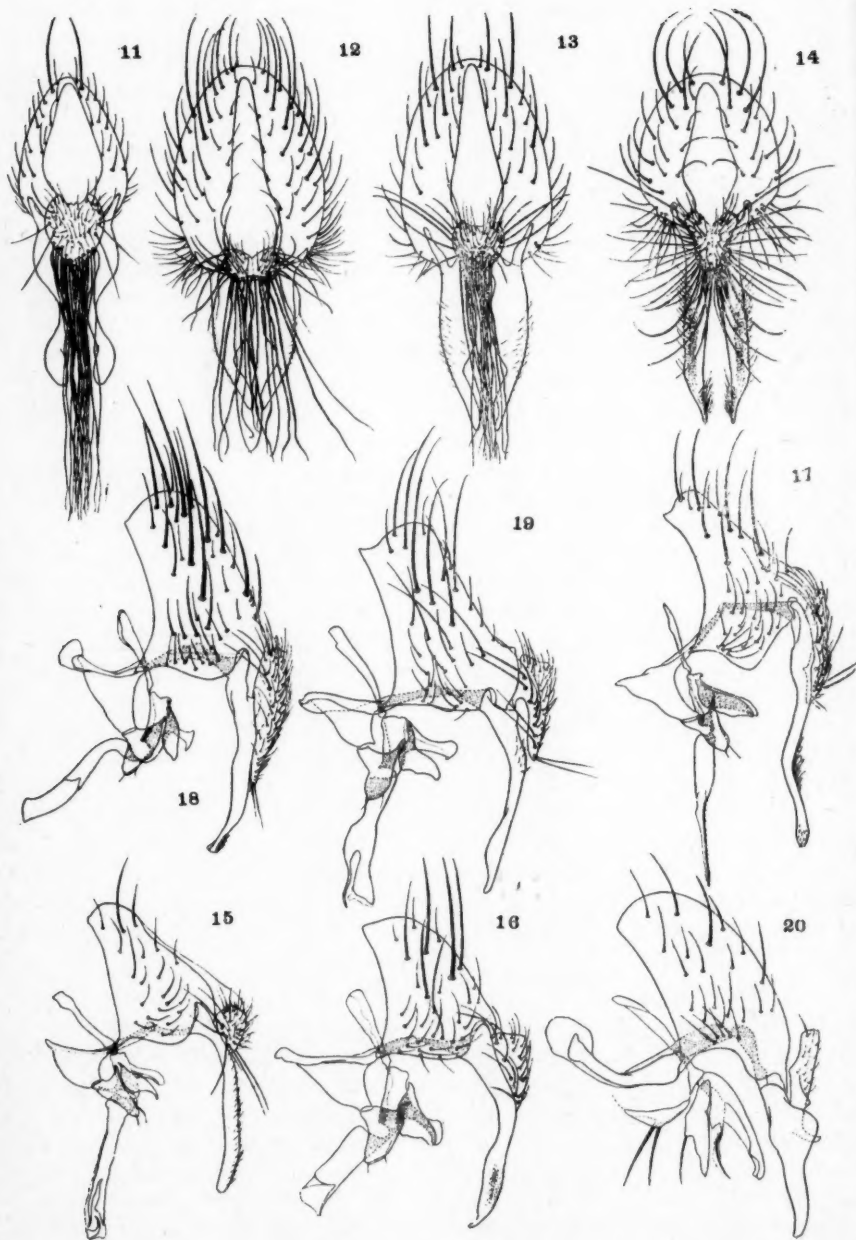
Record:—1 ♂ Banff, Alta., May 27, 1922 (C. B. D. Garrett).

Type No. 2936 in Canadian National Collection.

The male of this species may be readily distinguished from those closely related by the chaetotaxy of the hind tibia and hind tarsus, and by the structure of the processes of fifth abdominal sternum.

***Hylemyia sedula* sp. nov.**

Male grayish pollinose: head with silvery pruinescence and dark reflections: face concolorous with parafacials; frontal vitta opaque black with reddish tinge at base of antennae; first and second antennal segments largely reddish on apical half, more or less infuscated basad; third antennal segment entirely blackish: palpi fuscous. Thorax with two brownish vittae on the lines of dorsocentral bristles, otherwise unmarked; abdomen with a fuscous, linear dorsocentral vitta and traces of incisures along the cephalic margin of each tergum; basal segment of hypopygium shining black; legs blackish, tarsi brownish tinged; wings yellowish tinged, veins yellowish, $m-cu$ cross vein darker; halteres pale yellow; calyptrae whitish.

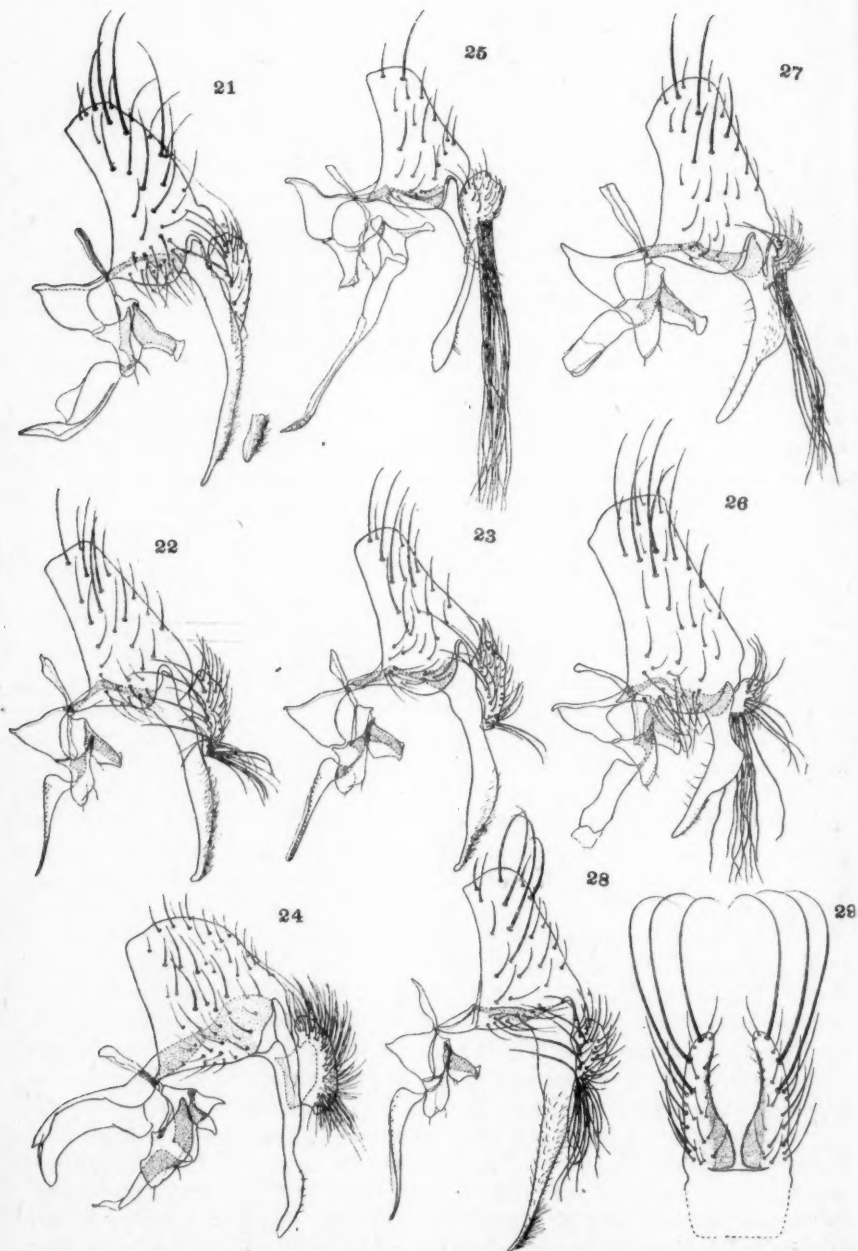


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Head with eyes separated at narrowest by a distance about equal to three-quarters length of third antennal segment; cephalic pair of ocellar bristles well developed, nearly as long as oral vibrissae; frontal vitta about half as broad immediately cephalad of anterior ocellus as at base of antennae, gradually expanding cephalad, with a weak and a stronger pair of cruciate setulae; parafrontals in profile prominent, with three pairs of bristles and a few scattered setulae; parafacials at base of antennae nearly equal in breadth to three-quarters length of third antennal segment, but little narrowed ventrad; cheeks about equal in width to average breadth of parafacials, narrowed caudad, marginal bristles unequally developed, with two stoutly developed pairs: third antennal segment about twice as long as broad, arista short pubescent, longest hairs slightly longer than basal diameter of arista; palpi short, about equal in length to that of third antennal segment; proboscis narrow. Thorax with acrosticals irregularly paired, with two or three presutural pairs; posthumeral bristle not duplicated: prealar bristle longer than posterior notopleural bristle: sternopleural bristles, 2:2, all strongly developed. Abdomen cylindrical, slightly depressed basad; marginal bristles of terga noticeably long and strong laterad of dorsum, on the ventral aspect of terga much weaker; hypopygium small, encased within the caudal segments; processes of fifth sternum widely separated at base, with a series of fine setulae along inner margin, outer border with a few scattered bristles, those on apical half much weaker and shorter than those on basal half.

Fore tibia with a short median anterodorsal, a median posteroventral, and a well developed, pointed, apical posteroventral bristle; mid femur with a series of short bristles on posteroventral surface, which become weaker on distal half; mid tibia with 1 anterodorsal, 3 posterodorsal, and 2 posteroventral bristles; hind femur with a series of 9 or 10 short anteroventral bristles, those on proximal three-fifths unequally developed and more widely spaced than those on distal two-fifths, the latter in an even series, posteroventral surface with 2 or 3 short bristles on median third besides the normal short series of apical bristles; hind tibia with 5 to 7 anteroventral, 4 or 5 anterodorsal, 4 posterodorsal bristles, and an irregular spaced series of posteroventral setulae: posteroventral apical bristle strongly developed. Pulvilli large, subequal. Wings with costal thorn strongly developed; veins M_{1+2} and R_{4+5} subparallel, *m-cu* cross vein nearly straight and erect.

Female similar to male, densely grayish pollinose; parafacials, viewed in profile, with a well defined darkened reflection at base of antennae which becomes silvery when viewed from in front; abdomen, viewed from behind, with traces of fuscous dorsocentral marks. Head with bristles stoutly developed, cruciate bristles present; sternopleural bristles, 2:2, the ventral bristle of the cephalic pair much weaker than remainder: abdomen with first sternum almost bare, at most with one or two weak setulae: fore tibia with no median anterodorsal bristle, with 1 or 2 posteroventral bristles; mid femur with 3 or 4 short bristles on apical third of anteroventral surface, with 1 or 2 weak bristles on proximal half of posteroventral surface: mid tibia with 1 anterodorsal, 2 posterodorsal, and 2 posteroventral bristles; hind femur with 6 anteroventral bristles and 3 or 4 weaker bristles on proximal half of posteroventral surface; hind tibia with 3 anteroventral, 5 anterodorsal, 3 posterodorsal bristles, apical posteroventral bristle strongly devel-



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oped. Wings short and broad, costal thorn strong, setulae semierect. Length, 6 mm.

Records:—1 ♀ Aweme, Man., May 23, 1922; 1 ♂ June 18, 1922; 1 ♀ July 28, 1920 (H. A. Robertson).

Type and allotype, No. 2937 in Canadian National Collection.

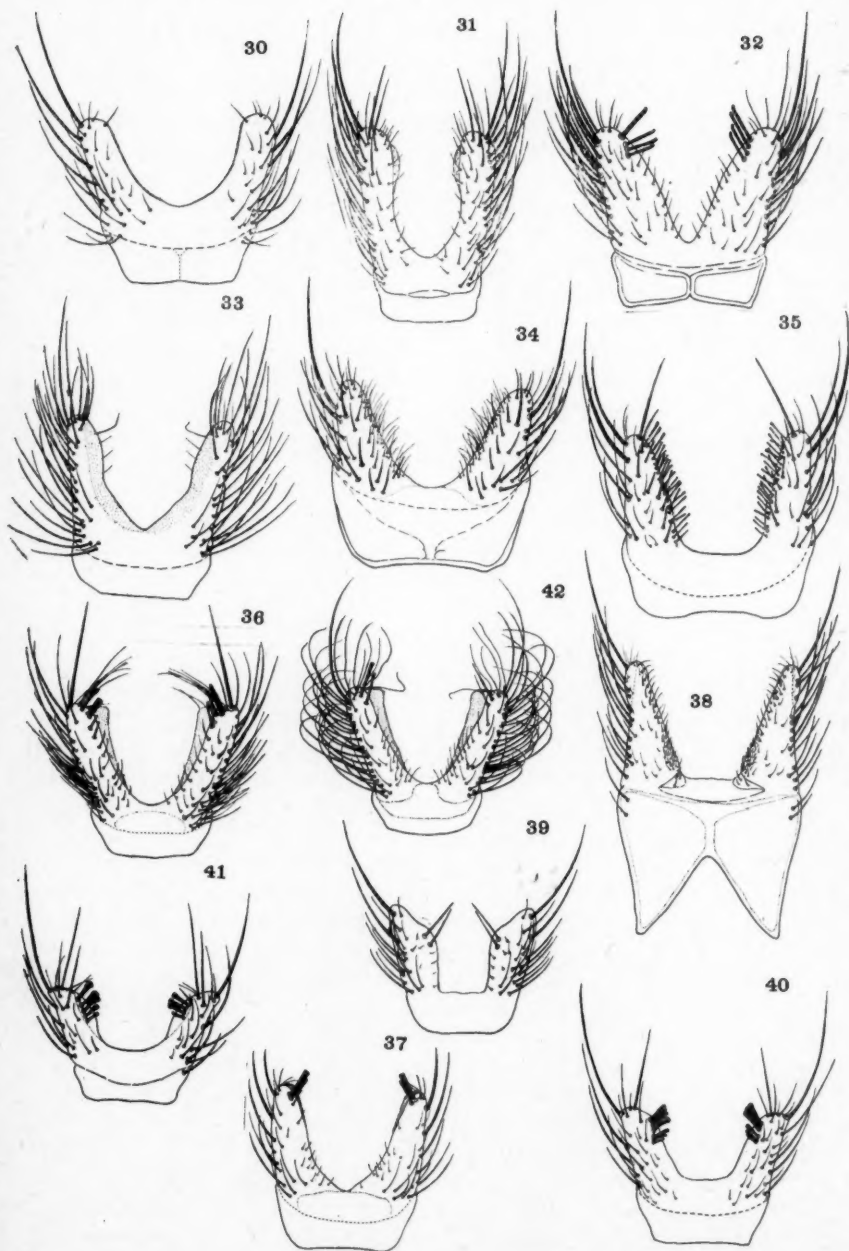
Superficially the species resembles *pullula* Zett., and is closely related to the one following. From *pullula* it may be readily distinguished by the lack of infuscation on wing membrane adjacent to the cross veins, the shorter palpi, and more prominent parafacials, and, further, in the male by the wider separation of the eyes, and the appearance of the processes of fifth abdominal sternum.

***Hylemyia consobrina* sp. nov.**

Male grayish; head with parafrontals, parafacials and cheeks silvery pruinulent with reddish reflections; frontal vitta tinged with reddish; antennae blackish, second segment with faint brownish caste; palpi blackish; proboscis shining. Thorax, viewed from behind, with disc of mesonotum and scutellum lightly tinged with dark grayish pruinescence in contrast to the lighter shading of the humeral and notopleural callosities, with three narrow vittae of which the median is more obscure than sublaterals, sides of disc with blackish infuscation as in *Pegomyia lipsia* Walk.; abdomen more densely grayish pollinose than thorax, with dark reflections, viewed from behind the dorsocentral vitta composed of narrow, subtriangular, fuscous marks which merge cephalad into the fuscous, tergal incisures: basal sclerites of hypopygium piceous, polished, apical region of processes of fifth sternum blackish and shining; legs blackish, knees narrowly reddish; pulvilli tinged; wings faintly tinged on anterior half; veins yellowish brown, paler basad; calyptres whitish; halteres pale yellow.

Head with eyes large, separated at narrowest by distance slightly greater than diameter of anterior ocellus; parafrontals contiguous, frontal vitta small, cruciate setulae present; parafrontals with four pairs of weak bristles; cheeks and parafacials narrow, the latter at base of antennae equal to three-quarters breadth of third antennal segment; third antennal segment about twice as long as broad, arista with sparse pubescence, longest hairs about equal in length to diameter of basal thickening; palpi slender. Thorax with acrosticals irregularly paired, with four presutural pairs of which one pair is slightly more developed than remainder; posthumeral bristle not duplicated; prealar bristle longer than posterior notopleural bristle; sternopleural bristles, 3:2. Abdomen cylindrical: bristles developed as in *sedula*, basal sclerite of hypopygium with longish bristles, processes of fifth sternum with a sparsely set series of fine setulae on inner margin, which become longer apicad, inner border with numerous fine setae, outer border with a series of 3 or 4 bristles on basal half.

Fore tibia with a short anterodorsal and a median posteroventral bristle, apical posteroventral bristle well developed and pointed; mid femur with 4 or 5 short fine bristles on proximal half of anteroventral surface, with 4 or 5 bristles on proximal half and an appressed series of short fine bristles on distal half of posteroventral surface: mid tibia with 2 anterodorsal, 3 posterodorsal, and 2 posteroventral bristles: hind femur with an entire series of stout anteroventral bristles and an entire series of semierect setulae on anterior surface immediately dorsad of the anteroventral series, posteroventral surface with 5 bristles on prox-



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imal three-fifths, and a series of 7 short, fine bristles on distal two-fifths; hind tibia with 4 anteroventral, 5 anterodorsal, and 4 posterodorsal bristles, posteroventral surface with a series of irregularly spaced setulae, apical posteroventral bristle strongly developed. Pulvilli and claws elongate, those of fore tarsi longer than those of mid and hind tarsi. Wings with costal thorn small; veins R_{4+5} and M_{1+2} subparallel, *m-cu* cross vein sinuate. Length, 6.5 mm.

Records:—1 ♂ Campbellton, N.B., June 17, 1914 (F. M. McKenzie).

Type, No. 2938 in Canadian National Collection.

The male closely resembles that of *sedula*. The features of the head differ however, in that the parafacials and cheeks are more pronounced, the eyes more widely separated, and the palpi shorter in *sedula* than in *consobrina*.

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EXPLANATION OF PLATES

Plate I.

- Fig. 1 Dorsal (or caudal) aspect of cerci, gonostyli and tergum 9 of *Hylemyia crucifera*.
- Fig. 2 Dorsal (or caudal) aspect of cerci, gonostyli and tergum 9 of *Hylemyia gemina*.
- Fig. 3 Dorsal (or caudal) aspect of cerci, gonostyli and tergum 9 of *Hylemyia pentaformis*.
- Fig. 4 Dorsal (or caudal) aspect of cerci, gonostyli and tergum 9 of *Hylemyia repleta*.
- Fig. 5 Dorsal (or caudal) aspect of cerci, gonostyli and tergum 9 of *Hylemyia occidentalis*.
- Fig. 6 Dorsal (or caudal) aspect of cerci, gonostyli and tergum 9 of *Hylemyia impersonata*.
- Fig. 7 Dorsal (or caudal) aspect of cerci, gonostyli and tergum 9 of *Hylemyia neomexicana*.
- Fig. 8 Dorsal (or caudal) aspect of cerci, gonostyli and tergum 9 of *Hylemyia garretti*.
- Fig. 9 Dorsal (or caudal) aspect of cerci, gonostyli and tergum 9 of *Hylemyia propinqua*.
- Fig. 10 Dorsal (or caudal) aspect of cerci, gonostyli and tergum 9 of *Hylemyia lobata*.

Plate II.

- Fig. 11 Dorsal (or caudal) aspect of cerci, gonostyli and tergum 9 of *Hylemyia seamansi*.
- Fig. 12 Dorsal (or caudal) aspect of cerci, gonostyli and tergum 9 of *Hylemyia frontulenta*.
- Fig. 13 Dorsal (or caudal) aspect of cerci, gonostyli and tergum 9 of *Hylemyia canadensis*.
- Fig. 14 Dorsal (or caudal) aspect of cerci, gonostyli and tergum 9 of *Hylemyia setisissima*.
- Fig. 15 Lateral aspect of male copulatory appendages of *Hylemyia crucifera*.
- Fig. 16 Lateral aspect of male copulatory appendages of *Hylemyia gemina*.
- Fig. 17 Lateral aspect of male copulatory appendages of *Hylemyia pentaformis*.
- Fig. 18 Lateral aspect of male copulatory appendages of *Hylemyia repleta*.
- Fig. 19 Lateral aspect of male copulatory appendages of *Hylemyia occidentalis*.
- Fig. 20 Lateral aspect of male copulatory appendages of *Hylemyia impersonata*.

Plate III.

- Fig. 21 Lateral aspect of male copulatory appendages of *Hylemyia neomexicana*.
- Fig. 22 Lateral aspect of male copulatory appendages of *Hylemyia garretti*.
- Fig. 23 Lateral aspect of male copulatory appendages of *Hylemyia propinqua*.
- Fig. 24 Lateral aspect of male copulatory appendages of *Hylemyia lobata*.
- Fig. 25 Lateral aspect of male copulatory appendages of *Hylemyia seamansi*.
- Fig. 26 Lateral aspect of male copulatory appendages of *Hylemyia frontulenta*.
- Fig. 27 Lateral aspect of male copulatory appendages of *Hylemyia canadensis*.
- Fig. 28 Lateral aspect of male copulatory appendages of *Hylemyia setisissima*.
- Fig. 29 Ventral aspect of sternum 5 of *Hylemyia crucifera*.

Plate IV.

- Fig. 30 Ventral aspect of sternum 5 of *Hylemyia gemina*.
- Fig. 31 Ventral aspect of sternum 5 of *Hylemyia pentaformis*.
- Fig. 32 Ventral aspect of sternum 5 of *Hylemyia repleta*.
- Fig. 33 Ventral aspect of sternum 5 of *Hylemyia occidentalis*.
- Fig. 34 Ventral aspect of sternum 5 of *Hylemyia impersonata*.
- Fig. 35 Ventral aspect of sternum 5 of *Hylemyia neomexicana*.
- Fig. 36 Ventral aspect of sternum 5 of *Hylemyia garretti*.

- Fig. 37 Ventral aspect of sternum 5 of *Hylemyia propinqua*.
 Fig. 38 Ventral aspect of sternum 5 of *Hylemyia lobata*.
 Fig. 39 Ventral aspect of sternum 5 of *Hylemyia scamansi*.
 Fig. 40 Ventral aspect of sternum 5 of *Hylemyia frontulenta*.
 Fig. 41 Ventral aspect of sternum 5 of *Hylemyia canadensis*.
 Fig. 42 Ventral aspect of sternum 5 of *Hylemyia setisissima*.

DESCRIPTIONS OF NEW CANADIAN PARASITIC HYMENOPTERA.*

BY G. STUART WALLEY,

Ottawa, Ont.

ICHNEUMONIDAE

Apechthis ornatulus n. sp.

Male.—Length 10 mm.; antenna 8 mm.

Head shining; vertex feebly convex; front with sparse weak punctures. Malar space scarcely one-fourth as long as basal width of mandible. Thorax shining; sparse weak punctures on dorsal third of pronotum, meso-scutum, scutellum, anterior half of mesopleura, mesosternum and metapleura; propodeum with distinct rather dense punctures except for polished mid-dorsal area where punctures are obsolete. Upper hind angles of propodeum evident but not strongly developed; carinae weak, present only at base. Abdomen densely punctate, especially basally, the punctures elongate and more distinct on anterior tergites. First tergite moderately angulate above, laterally rugosely coriaceous. Second tergite one-fourth longer than each of the following three which are subequal in length.

General aspect black. Mandibles black tipped; palpi, clypeus, inner orbits of eyes, face except for median stripe and triangle below each antenna, yellowish white. Antenna black above, scape and pedicel yellowish below, flagellum yellowish brown below with incisures darker. Thorax black; tegulae, apices of scutellum and postscutellum, small spot on mesopleura below wing, yellowish. Front coxae black all round at base, yellowish inwardly and in front, reddish behind; middle coxae yellowish in front, reddish behind; hind coxae reddish throughout. Front trochanters, front tibiae and tarsi, middle femora at apices, middle tibiae and middle tarsi except apex of fifth tarsal, yellowish. Front femur reddish yellow on anterior face and at apex, yellowish on remaining surfaces; middle femur reddish except at apex; hind femur reddish with blackish spot on apex above. Hind tibia narrowly blackish at base, thence to middle with an incomplete whitish annulus, beyond middle black. Extreme apex of fifth tarsal of middle leg and entire hind tarsus, dark brown. Abdomen black, incisures of venter narrowly yellowish.

Holotype.—♂, Aweme, Manitoba, June 27, 1922, (R. N. White); No. 2977 in the Canadian National Collection, Ottawa.

Paratype.—♂, Banff, Alberta, May 31, 1922, (C. B. D. Garrett).

Distinguished from *A. picticornis* (Cress.) and *A. comptonotus* (Davis) by the tricolored front coxae, from *A. ontario* (Cress.) by the maculate face and from *A. pacificus* Cush., to which it traces in Cushman's key (Proc. U. S. N. M., 58, 352, 1921), by the non-annulate middle tibiae.

The paratype differs only slightly in having the yellowish markings on

*—Contribution from the Division of Systematic Entomology, Entomological Branch, Dept. of Agric., Ottawa.

the legs more suffused with reddish and the hind femora without the blackish mark on apex.

The holotype emerged from a Tortricid pupal case.

***Angitia albertae* n. sp.**

Female.—Length 5.5 mm.

Head black with rather short whitish pubescence. Mandibles yellow, brownish tipped; palpi whitish. Antenna wholly black. Thorax black, tegulae yellow. Propodeum with areola and petiolarea confluent, region of latter coriaceous. Areolet moderately large, subtriangular, sessile. Recurrent vein received much beyond middle of areolet. Coxae black, the posterior pair wholly, the anterior pair yellowish at apices and the middle pair obscurely reddish yellow at apices below. Entire front, middle and apical joint of hind trochanters, yellow; basal joint of hind trochanters, black. All femora reddish brown throughout. Front and middle tibiae paler reddish yellow, the latter with bases narrowly yellowish. Hind tibiae dirty yellowish brown with a sub-basal and an apical brownish suffusion joined ventrally. Front and middle tarsi dusky yellowish the apical half of basi-tarsi and remaining joints darkened above. Abdomen black above, first sternite and incisures of following, yellowish.

Holotype.—♀, Slave Lake, Alberta, July 14, 1924, (Owen Bryant); No. 2978 in the Canadian National Collection, Ottawa.

Paratype.—♀, same locality, Aug. 16, 1924, (Owen Bryant).

This species would trace to couplet 8 in Viereck's key (Can. Ent., 57, 227, 1925), but differs from *ptero-phorae* Ashm. and *rosanae* Vier. in the color of the coxae.

In the paratype the areolet has a short petiole, the middle tibiae are pale behind and the hind tibiae have a more distinct pale median annulus.

***Angitia triops* n. sp.**

Male.—Length 6 mm.

Head black with rather long and dense whitish pubescence. Mandibles (except tips) and clypeus, yellow. Antenna black; scape yellow with a lateral dash of brown; pedicel yellow below, blackish above. Palpi and labium whitish. Thorax black; posterior angle of pronotum, apical half of proepisternum, tegulae, yellowish white. Propodeum with areola and petiolarea confluent, region of the latter weakly rugosely coriaceous. Areolet small, subtriangular, petiole as long as inner anterior side. Recurrent vein received much beyond middle of areolet. Anterior four coxae and trochanters, yellowish white. Front femora yellowish suffused with reddish. Front tibiae and tarsi yellowish white the extreme apices of the latter darkened. Hind coxae, trochanters and femora distinctly reddish. Hind tibia dirty reddish, extreme base obscurely yellowish with narrow obscure sub-basal and apical brownish rings. Hind tarsi dirty yellowish brown, basi-tarsi slightly paler toward base. Abdomen with ground color black; petiole black; first tergite dark reddish brown on apex above, more distinctly reddish laterally on apical third and with a small sub-basal reddish lunule; second tergite with black triangle extending from base of tergite to apex at middle of dorsum; remaining tergites with reddish confined to lateral region. Venter reddish, the incisures yellowish.

Holotype.—♂, St. Thomas, Ontario, July 30, 1924 (H. G. D.); No. 2979 in the Canadian National Collection, Ottawa.

Traces to *A. rivalis* (Cress.) in Viereck's key but easily distinguished by the yellow clypeus and different abdominal markings. *A. rivalis* (Cress.) was described from specimens obtained from Texas.

***Angitia incipiens* n. sp.**

Female.—Length 5.5 mm.

Head black with rather short whitish pubescence. Mandibles yellow, brownish tipped; palpi whitish. Antenna wholly black. Thorax black, tegulae yellow. Propodeum with areola and petiolarea confluent, region of latter weakly coriaceous. Areolet moderately large, subquadrate, petiolate. Recurrent vein received very slightly beyond middle of areolet. Coxae black, posterior and middle pair wholly, anterior pair yellowish at apices. Front trochanters yellow; basal joint of middle trochanters fuscous on basal half, thence yellow; basal joint of hind trochanters black, apical joint yellowish. Front femora, tibiae and basal four tarsals, reddish brown. Middle femora reddish, blackened at apices; middle tibiae reddish brown; middle tarsi brownish. Hind femora reddish brown blackened at base and apex above; hind tibiae reddish brown with a narrow sub-basal and broader apical fuscous band, the intermediate area yellowish brown on either side; hind tarsi fuscous, bases of basal four joints, brownish. Abdomen black above; first sternite largely yellow, incisures of following, yellowish.

Holotype.—♀, London, Ontario, Oct. 19–Nov. 6, 1928, (V. R. Diamond); No. 2980 in the Canadian National Collection, Ottawa.

Paratypes.—4 ♀♀, same data as the holotype.

The type specimens of this species were obtained from the window of a laboratory at the University of Western Ontario. Mr. V. R. Diamond states that they are possibly parasites of Mediterranean flour moth larvae which were being reared in an adjoining room. Through the kindness of Mr. Diamond in providing material for study, the writer is able to present the foregoing description of the species. Paratypes are deposited in the National Collection and in the collection of the Department of Zoology, University of Western Ontario.

The species traces to couplet 11 of Viereck's key and has black hind coxae but the hind tibiae lack the whitish annulus. *A. incipiens* closely resembles *A. albertae* but is easily distinguished by the different position of the recurrent vein.

The following key is included to facilitate the separation of the species of *Angitia* known to occur in Canada.

TABLE OF SPECIES

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|---|------------------------|
| 1. Abdomen in part reddish above | <i>triops</i> n. sp. |
| Abdomen black throughout above | 2. |
| 2. Hind coxae reddish brown | <i>rosanae</i> Vier. |
| Hind coxae black | 3. |
| 3. Middle coxae distinctly yellow in part | <i>basizona</i> Vier. |
| Middle coxae black or reddish in part | 4. |
| 4. Middle coxae reddish brown except bases | <i>cacoeciae</i> Vier. |
| Middle coxae black throughout | 5. |
| 5. Hind tibiae uniformly reddish brown throughout | <i>macer</i> (Cress.) |
| Hind tibiae with a dark sub-basal and apical ring | 6. |

6. Mandibles stramineous; front trochanters unicolorous with femora
 *fenestralis* (Holmg.)
 Mandibles clear yellow, brown tipped; front trochanters yellow 7.
 7. Recurrent vein received very slightly beyond middle of areolet; hind femora
 with apex blackish above *incipiens* n. sp.
 Recurrent vein received much beyond middle of areolet, so far beyond that
 areolet is sub-triangular; hind femora without apex darkened
 *albertae* n. sp.

Viereck in his "Revision of the Campopleginae," first considered *Angitia* and *Diocetes* as subgenera of *Campoplex*. Subsequently his description of *Angitia* (*Diocetes*) *unicus* (Can. Ent., 58, 182, 1926) would indicate a change in his concept regarding the arrangement of these genera. The holotype of *unicus* Vier. has been examined and it keys readily to *Diocetes* in Viereck's key to the subgenera of *Campoplex* (Can. Ent., 57, 201, 1925). Until further evidence is at hand a discussion of the relative values of the generic and subgeneric units appears futile. Incidentally, *Inareolata* Ellinger and Sachtleben, has recently been proposed to replace *Diocetes* Foer. which is shown to be preoccupied (Sci. Rept. Int. Corn Borer Invest. 116, 1928, Chicago).

The type of *Angitia americana* Harrington, described from British Columbia, has been examined and the species is referred to the genus *Seleucus*, hence it does not appear in the foregoing key. The holotypes of *A. rosanae* Vier., *A. basizona* Vier. and *A. cacociae* Vier. have all been studied. A specimen of *A. macei* (Cress.), is at hand from Macdiarmid, Lake Nipigon, Ont., July 11, 1923 (N. K. Bigelow). There are also five specimens from Ottawa, Ont., Sept., 1924 (A. Richardson) which answer to the description of *A. fenestralis* (Holmg.).

MYMARIDAE

In an exhaustive search for egg parasites of *Lygus pratensis* (Linn.) carried on at Ottawa, by Mr. R. H. Painter, three specimens of an undescribed species of *Polynema* were secured. Through the kindness of Mr. Painter the writer is permitted to present the following description for the species.

***Polynema pratensiphaga* n. sp.**

Male.—Length .8 mm. Eyes reddish. Cheeks dark brown. Mouth parts, vertex, occiput and face below antennae, brown. Front above antennae and between eyes, also a short median dash below, pale yellowish brown. A pair of yellowish, converging dashes on occiput, arising from inner posterior angles of eyes and directed toward foramen. Scape and pedicel yellowish, the latter with a brownish dash above; funicle uniformly dark brownish. Thorax dark brownish black. Coxae except apices, trochanters, femora except narrow base and broader apex, tibiae and fourth tarsal, brownish; remainder of legs yellowish. Abdomen brown, the basal segments darker; abdominal petiole yellowish.

Front wings with cilia rather coarse and arranged in about fourteen longitudinal rows at widest portion of wing. Marginal cilia on apical half of front wing, long, the longest equal to greatest width of wing. Hind wing with some cilia on hind margin five times as long as wing is wide and at least twice as long as cilia on anterior margin. Along anterior margin of hind wing is an irregular sparse row (excluding marginals) of cilia beginning slightly beyond apex of vein and extending to apex of wing, gradually shorter approaching base; hind

margin (excluding long marginals) with a few short cilia.

Head smooth. Scutellum with curved line of foveae at apical three-fourths and a pale point on either side at basal third. Dorsum of thorax unsculptured.

Antenna thirteen jointed; funicle with a few fine hairs; joints longitudinally striate. Scape ovate, slightly shorter than the more broadly ovate pedicel. Joints proportioned from base as follows (measurements in millimetres)—.064 : .046 : .092 : .112 : .112 : .112 : .112 : .112 : .104 : .104 : .104 : .100 : .096. Tarsal joints with following proportions (in millimetres)—

	Basal joint	2nd joint	3rd joint	Apical joint
Front tarsus	.084	.064	.056	.060
Middle tarsus	.088	.060	.050	.052
Hind tarsus	.088	.060	.048	.056

Anterior tibiae with forked spur and basi-tarsi with strigil as in *striaticorne* Gir.

Female.—Length .9 mm. Color as in male. Antenna nine jointed, joints proportioned from base as follows (in millimetres)—.092 : .056 : .040 : .080 : .048 : .044 : .044 : .060 : .140. Scape ovate; pedicel subpyriform, greatest diameter .036 mm. First two funicle joints slender; third funicle joint slightly thickened apically; fourth, fifth and sixth funicle joints thicker, sub-ovate; club ovate, greatest diameter .052 mm. Antenna weakly striate and with fine sparse cilia on funicle joints.

Holotype.—♂, Ottawa, Ont., Aug. 10, 1928, (R. H. Painter); No. 2981 in the Canadian National Collection, Ottawa.

Allotype.—♀, Ottawa, Ont., July 14, 1928, (R. H. Painter).

Paratype.—♂, Ottawa, Ont., Aug. 10, 1928, (R. H. Painter).

Host.—The above mentioned specimens were found fully developed within the eggs of *Lygus pratensis* (Linn.) deposited in Common Mullein, a favorite host plant for the tarnished plant bug. All specimens were dissected from the eggs and mounted on slides.

The species appears to be related to *Polynema striaticorne* Gir., but differs in wing and antennal characters. In Girault's key (Trans. Am. Ent. Soc., 37, 318, 1911) it traces to *maculipes* Ashm., described from Florida.

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